

# HIERARCHICAL VALUE OF THE PHYSICAL EDUCATION CURRICULA CONTENTS INTENDED FOR SECONDARY SCHOOL FEMALE STUDENTS

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## Abstract:

The goal of the research was to determine the values of the secondary school physical education curriculum contents intended for female students. The evaluation was performed on a 5-point Likert scale by top-quality PE teachers, experts in PE teaching techniques and the student teaching mentors. They assessed the relative importance of each curriculum content item with regard to its contribution to the transformation of the main anthropological characteristics in the secondary school female students and from the aspect of the level of applicability in real-life as well. The obtained results indicate that different content items have diverse influences generally on the totality of human characteristics and practical purposes, as well as specifically on a particular anthropological feature and utility. These findings are important prerequisites for the objective planning of the teaching process from the aspect of an adequate exercise-contents selection.

**Keywords:** PE curriculum, contents-selection, teaching planning, anthropological characteristics, benefits/utilities

## DIE BEWERTUNG DER INHALTE DES SPORTUNTERRICHTS BEI DEN MITTELSCHÜLERINNEN

### Zusammenfassung:

Das Ziel dieser Untersuchung war, den Inhaltswert des Sportunterrichts bei den Schülerinnen aller vier Klassen der Mittelschule festzustellen. Die Bewertung wurde von den experten Fachleuten und Mentoren für die Methodik der Kinesiologie durchgeführt. Die Likert-Skala wurde angewendet, damit die Bedeutung jedes einzelnen Unterrichtsinhaltes für die Entwicklung jedes wichtigerer anthropologischer Kennzeichnungen, sowie für die Befriedigung utilitärer Bedürfnisse bewertet werden konnte. Die Ergebnisse zeigen, dass verschiedene Inhalte sehr vielfältige Einwirkung ausüben, sowohl gemeinsam auf alle Eigenschaften, Fähigkeiten und Utilitäten als auch auf jede einzelne Eigenschaft, Fähigkeit und Utilität.

Diese Ergebnisse können ihre Anwendung beim Programmieren der Inhalte des Trainingsprozesses finden.

**Schlüsselwörter:** Sportunterricht, anthropologische Merkmale, Utilitäten, Programmieren, Schülerinnen, Mittelschule

## Introduction

In the domain of kinesiology the term regulated exercise process implies solving numerous hierarchically arranged and interrelated issues. These issues are usually included in the concepts of planning, performing and evaluating (control of the effects of) the process of exercise. With no intention of dealing with all eight factors concerning the directed exercise process in detail, we should state here that the scientific issue in question could be presented as the problem of an exact implementation of the diagnostic and prognostic procedures in order to establish such exercise programmes designs that will maximally correspond with the status of a subject and the previously defined aims, planned to be achieved through the actual exercise programme administration.

When an education system is referred to, it should be stressed that numerous issues of the regulated exercise process have been solved in previous research studies (Vanék, 1990; Mraković, 1987; Grgin, 1987; Findak, 1997). First, orientation norms relative to both genders and all ages of the primary and secondary school students have been established (Findak et al., 1996; Findak et al., 1992; Metikoš et al., 1990) for the majority of the crucial anthropological characteristics and motor skills/ knowledge. These standards are the starting points in the individual work programmes' design when the actual anthropological status of a subject is known.

Nevertheless, there still exists a certain number of problems that are limiting factors in the scientific approach to the exercise planning. One of such issues is undoubtedly the selection of the PE work contents. The contents which should be included in the

process of exercising in order to achieve the predetermined goals based on the known status of a person involved in exercising is of both academic and practical importance. The problem arises from almost the infinite number of potential exercise content items or kinesiological operators. The immensity induces the question of how to determine the so called proper or valid portion of each item's variance. With regard to it one should keep in mind that different contents can be utilized for achieving diverse aims, or that several content items can be used for achieving multiple goals simultaneously, while the others may be useful only for a particular, specific goal accomplishment. Additionally, the fact that different people prefer different exercise activities makes the problem of the kinesiological contents selection more complex. The preferences should by no means be disregarded in the process of the exercise or PE lessons planning (Beiner, 1992; Mraković et al., 1986; Rozman, 1985).

The issues mentioned are subjects of the scientific project "Human motor skills/knowledge", granted by the Ministry of Science and Technology of the Republic of Croatia.

Previous research (Findak et al., 1997; Mraković et al., 1998) confirmed the hypothesis that diverse PE teaching contents, derived from the official primary school curricula, influenced differentially the development of students' attributes and capabilities, as well as the real-life performance in a range of everyday or challenging activities (utilitarian value of a content). The similar results are expected in this research, the objective of which is to determine the contribution of the PE teaching contents to the basic anthropological characteristics changes in secondary school female students, as well as to the acquisition and consolidation of numerous indispensable skills and knowledge which may enhance physical competence in everyday adult performance.

It is reasonable to expect the findings of the research to be not only of a theoretical value, but of significant practical importance to the process of the exercise contents-selection for the previously defined aims achievement – the changes in the anthropological characteristics and meeting the practical needs of life and health benefits (utility) of secondary school female students.

## Methods

The estimation was performed by forty prominent experts in PE teaching, graduates from the Faculty of Physical Education and professionals with at least several years of experience in teaching PE in schools. They are recognized as the Faculty of PE part-time collaborators at the university study course Kinesiological Methodics as mentors to the undergraduate students and student teaching supervisors. Their task was to assess the value of each content item of the secondary school PE curricula for female students from the 1<sup>st</sup> to 4<sup>th</sup> form. Evaluation was performed with regard to the anthropological characteristics transformation and possible beneficial and practical effects (utility).

In order to ensure the quality of assessment, all the experts - judges have been first additionally trained for this kind of job. Special attention has been paid to providing an equal level of understanding and to reaching an unambiguous definition of each characteristic, ability and utilitarian need subjected to the assessment. The necessity of an impartial and conscientious assessment has been stressed and different examples of the procedure have been simulated.

For the purposes of the research two scales of a 5-grade Likert type were constructed where mark 1 means the least and mark 5 the greatest influence on the attributes and benefits. Each expert was instructed to mark the contribution of a particular content item to the changes of human characteristics and abilities on the first scale, and to the level of life applicability (evaluation of the PE curricula utility), on the second.

Actually, on the first scale the experts assessed the contribution of a particular content item to the transformation (enhancement, reduction, or maintenance) of:

- ballast mass (BM)
- muscle mass (MM)
- speed (BR)
- co-ordination (KO)
- balance (RA)
- explosive power (EK)
- repetitive power (RS)
- static strength (ST)

- flexibility (FL)
- aerobic endurance(AI)

On the second scale the experts were supposed to assess the contribution of the same content items to:

- everyday life competence and performance (SV)
- emergency situation solving (UR)
- recreational purposes (RE).

The results obtained on the assessment scales were processed

for each year separately. For each of the assessed dimensions of attributes and utilitarian goals the average grade given by the experts was computed for each motor knowledge. The assessment of the comprehensive type of potential transformation value of the assessed content items has been derived as a sum of the mean values given by the judges concerning all the characteristics, abilities and utilities. It is presented as the last column in Tables 1-4 (SSS). The results obtained according to age are organized in an integral table and sorted according to a general assessment of the transformational power (SSS). The inner columns represent the values each content item has in relation to a particular characteristic, ability or practical/beneficial effect.

### List of the PE curricula content items – female students

1. The 1 <sup>st</sup> form of the secondary school
1.cyclic movements at various tempos up to 8 minutes
2.shorter distance (20 – 40m) running from a flying start
3.longer distance (60-100m) running from a standing start
4. 4 x 60m relays
5.polygon with obstacles executed in normal conditions various tasks
6.hitch-kick long jump (one and a half step)
7.high jump – straddle technique, taking off from the left and the right foot alternately
8. throwing 1, 2 and 3 kg medicine ball with one hand and with both hands
9.fence – lateral swing double-leg flank flight over the bar

10.swing tucked flight over
11.lateral hand travelling in a long hang
12.backward pullover to high bar by one-leg push-off)
13.trunk circling in a long hang on rings
14.climbing a rope-ladder
15.successive cartwheels performed to one side
16.squat mount, skip (pas chasse) forwards, open-closed hop, cat leap, stride leap, two-leg squat turn and toe rise stand position turns with 180° (80cm beam)
17.flank vault left and right
18.arched jumps and arched jumps with ½ turn (180°) on mini-trampoline
19.arm circles in frontal, lateral and horizontal plane (with a hoop, ball or ribbon) on the spot and while moving
20.swings with impulse
21.extended leg swings and circles in lateral plane on the spot
22.cross turns (180° and 360°) through the body wave to both sides
23.spiral turns to both sides
24.rope skipping while travelling with an extended leg in front, side and back raise
25.hops on the spot with front, back, and side leg raise combined with the ball throwing and catching
26.split leap (“cadette”) and half turn
27.stag leap
28.balance hold in the front, side, and back leg raise, free leg stretched or bent (hoop, ball)
29.balance hold after a turn/ pivot (hoop, ball)
30.the waltz and polonaise step; different running patterns to both sides combined with legs and arms movements
31.movements and improvisations according to different rhythmical structures
32.dance movement patterns: stamping steps; dances from the Dinara region
33.Cossak dance
34.defences against blows
35.defences against holds round the body
36.defences against holds on hair
37.dribbling from the start ahead, backwards or sideways and with the alterations of direction: zig-zag, forwards-backwards and slalom (B)
38.catching the balls coming from different

directions – passes are executed from a running or standing jump (B)
39. overhead jump passes over various distances (B)
40. pivoting (B)
41. free throws (B)
42. hooked shots (B)
43. deceptive actions with the ball – feinting the direction of dribbling and pass fake
44. defence – individual defence with switching (B)
45. offence – counter-attack with two or three players (B)
46. two-basket game (B)
47. from a basic starting posture overhand toss, medium and high, straight or deflected (V)
48. straight, overhead and deflected pass (V)
49. standing spiking from a two-leg take-off (V)
50. defence: covering/ protecting the court on receiving a service and on service (V)
51. offence: the second- and the third-ball play tactics (V)
52. playing over the net with a greater number of players (V)
53. submaximal dynamic and explosive stimuli (B) = basketball, (V) = volleyball

## 2. The 2<sup>nd</sup> form of the secondary school

1. cyclic movements at various tempos up to 10 minutes
2. shorter distance (20, 40, 60m) running from a flying start
3. longer distance (100-150m) running from a standing start
4. 4 x 60m relay running
5. polygon with obstacles – aggravated
6. long jump – individual motor achievements
7. high jump – a straddle technique with a take-off from the left or right foot
8. throwing a medicine ball (3-5 kg)
9. after a swing a straddle mount on a lower bar
10. forward support on the higher bar and a roll-front to a lay out forward on the lower bar
11. dive cartwheel
12. front support to straddled seat mount, the polka step, sissone, forward scissors, forward scale, stag leap dismount – beam
13. rear vault to the left or right

14. mini-trampoline straddle, pike, straddle, arched jumps and arched jumps with full turn (360°)
15. ribbon swings and circles with an impetus on the spot and while travelling
16. stretched free leg swings and circles while travelling in dancing steps (waltz, polka, chasse)
17. spiral turns to both sides with the ball
18. hop turns with 180°
19. hop turns with 360°
20. vertical jump with one stretched leg in back and front raise
21. criss-cross rope skipping forwards and backwards
22. stride leap into the rope
23. several scissors leaps backwards – forwards (linked)
24. front scale after a 360° turn
25. front scale after the split leap (“cadette”)
26. front scale after the stride leap
27. sinusoidal running through low stride leaps with leading movements of arms
28. underlying beat and phrases – free choice of apparatus and music (percussions, classic and modern music, jazz)
29. dance structure: vertical oscillations – drmesh; dances from the Pannonian region
30. social dances - rock dances
31. defences against holds on arms
32. defences against the strangling techniques
33. dribbling with alterations in the pace of movement at the moment of changing the direction of travelling (B)
34. receiving the ball with one hand on the spot, while moving and jumping; passing (B)
35. baseball pass (B)
36. one-hand post throw-in after a fake pivot (B)
37. feints by changing the direction and pace of movement (B)
38. defence – zone defences 1-2-2 and 2-1-2 (B)
39. offence – screens (B)
40. two - basket game (B)
41. two- and one-hand hitting the ball from the basic volleyball posture (V)
42. two-hand low digs (V)
43. passing the ball over longer or shorter distances with higher or lower trajectories (lob)

44. setting the ball for a spike (V)
45. overarm service
46. spike with approach and a two feet take-off
47. frontcourt defence – individual and group blocking
48. individual attack – service and spike
49. playing over the net
50. strength conditioning and flexibility development exercises
(B) = basketball, (V) = volleyball

### 3. The 3<sup>rd</sup> form of the secondary school

1. continuous travelling at different tempos up to 12 minutes
2. shorter distance (40, 60, 80m) running
3. longer distance (150-200m) running from a standing start
4. 50m - running over low hurdles
5. long jump and high jump – individual motor achievements
6. mini-trampoline – tuck backward jump with arch and turns to the right or left
7. throwing a medicine ball combined with jumping over
8. forward roll from a hand - stand
9. side kick to stride support and back to front support
10. underswing dismount from a front support
11. squat mount with the other leg extended laterally (wolf position)
12. waltz step with a half turn (180°) to the left and right
13. free floor exercise composition (individual motor achievements) with compulsory structures: cartwheels, scales (balances) and rolls, combined freely with different moving structures (balance positions, jumps, leaps, turns, dancing steps and others)
14. free exercise composition on uneven bars (individual motor achievements) with compulsory structures: pike swing, swing and underswing dismount
15. throwing and catching the hoop while dancing (waltz, polka)
16. horizontal one-hand rope circle above the head and a horizontal circle combined with a jump over (figure of eight) on the spot and while travelling
17. tucked scissor jumps over the rope

18. rope skipping in basic planes while dancing (chasse forward, polka)
19. free exercise composition (rope) – individual motor achievements with compulsory structures: waltz steps with one-hand rope circles in basic planes; both legs rope skipping with interhops with the front and the back leg raise
20. dimensional scale: 1 <sup>st</sup> , 2 <sup>nd</sup> , and 3 <sup>rd</sup> dimension
21. folk dances potpourri: dances specific for a certain region
22. social dances: cha-cha-cha, samba
23. fundamentals of the hand throwing techniques
24. fundamentals of the armlocking techniques
25. fundamentals of the strangle techniques
26. fundamentals of defences against the strangle techniques choking grapplings escapes
27. receiving (two hands down catch) the ball and passes: a baseball pass, lateral one- and two-hand underarm pass (B)
28. receiving and passing the ball with gradual increasing the speed of movement (B)
29. forward, backward, zig-zag, and slalom dribbling the ball with changes in rhythm of bouncing (high-low) (B)
30. pivot jump-shot (B)
31. stealing the ball from dribbling and throwing (B)
32. pivoting in one-on-one or one-on-two situations (B)
33. combined defence zone/man-to-man (B)
34. defence system alterations to change the rhythm of play (B)
35. adjusting the offence system of play according to the defence system alterations (B)
36. playing according to the basketball game rules (B)
37. auxiliary tactical exercises and playing the game (application of mastered technical patterns) (V)
38. exercises for the aerobic fitness and muscle endurance enhancement
(B) = basketball, (V) = volleyball

**4. The 4<sup>th</sup> form of the secondary school**

1. continuous travelling at different tempos for 12 and more minutes
2. shorter distance (60, 80, 100m) running
3. longer distance (200-300m) running from a standing start
4. 60m running over low hurdles
5. long jump and high jump – individual motor achievements
6. pike jump on mini-trampoline
7. throwing a medicine ball combined with a jumping over with a 180° turn
8. cartwheel from a run - up with a 180° turn (round-off)
9. half mill (underswing) dismount
10. 180° turn from a forward swing on rings
11. side steps (chasse) combined with a step and a 180° turn
12. scissors leap
13. forward scales from walking, running, hopping and jumping
14. free floor exercise composition (individual motor achievements) with compulsory structures as in the third form
15. free balance beam exercise composition – individual motor achievements with compulsory structures: forward scale from a jump, waltz steps with a turn, hops with front and back kick
16. rolling the hoop combined with skipping and jumping
17. tossing the ball from one hand to the other through the upper and lower forehand and low lateral arc
18. throwing the ball by spin release of the ball (arm rotation)
19. throwing the ball combined with pivoting
20. circling the ball round the body combined with bouncing it to the floor
21. free ball rolls over the arms
22. rolling the ball on the floor in various directions
23. free ball exercise composition – individual motor achievements with compulsory structures: tossing the ball from one hand to the other through upper and lower forehand arc; tossing the ball through the low lateral arc while walking, running, hopping or travelling with dance steps

24. dimensional scale (1, 2, 3) combined with steps, hops and balances
25. folk dances potpourri: dances specific for a certain region
26. social dances: disco-dances (improvisations with different structures)
27. fundamentals of the karate blows aimed at the Adam's apple, the lateral or back side of the neck
28. defences against the karate blows aimed at the Adam's apple, the lateral or back side of the neck
29. forward and back setting up for a spike (V)
30. retrieving the ball from the net (V)
31. court dive (running dive and roll) retrieving the ball (V)
32. frontcourt and backcourt defence (V)
33. collective and individual tactical forms of the attack (V)
34. playing according to the rules of the game (V)
35. playing the game – implementation of various offence and defence systems (B)
36. exercises for the anaerobic capacities enhancement

(B) = basketball, (V) = volleyball



## Results

*Table 1: Assessment of the utilitarian and transformational value presented as the ranking of 53 motor skills/knowledge items for female students of the 1st secondary school form – the classification (P) according to the sum of all the scalar values (SSS)*

(P = classification; S = a content item; SV = everyday life; UR = emergency situations; RE = recreational purposes; BM = ballast mass; MM = muscular mass; BR = speed; KO = co-ordination; RA = balance; EK = explosive power; RS = repetitive power; ST = static strength; FL = flexibility; AI = aerobic endurance; SSS = scalar values sum)

P	S	SV	UR	RE	BM	MM	BR	KO	RA	EK	RS	ST	FL	AI	SSS
01	53	4.00	3.80	4.60	3.60	4.00	1.40	2.20	1.20	3.40	3.40	2.80	1.00	3.20	38.60
02	1	4.40	4.80	5.00	4.40	3.00	2.20	1.60	1.40	1.60	2.40	1.20	1.20	4.80	38.00
03	5	2.60	4.20	3.40	3.20	3.20	3.20	3.60	2.80	3.00	2.00	1.60	1.80	3.00	37.60
04	2	2.80	5.00	2.80	3.00	3.00	5.00	2.00	1.40	4.00	2.00	1.20	1.20	2.00	35.40
05	46	2.00	1.00	4.40	4.00	3.00	3.20	3.60	1.40	2.60	2.00	1.60	1.80	4.40	35.00
06	3	2.40	4.60	4.00	3.60	2.60	4.60	2.00	1.40	3.20	2.00	1.00	1.20	2.20	34.80
07	4	1.60	3.00	2.40	3.20	2.40	5.00	2.80	1.60	3.40	2.00	1.20	1.20	2.20	32.00
08	24	1.60	1.00	3.60	3.20	2.80	2.00	3.60	1.80	2.80	2.20	1.20	2.00	3.00	30.80
09	6	1.80	3.60	1.60	2.40	2.00	3.00	3.40	1.40	4.80	1.80	1.20	1.60	1.40	30.00
10	33	1.40	1.00	2.80	3.20	2.40	2.00	3.80	2.00	1.80	2.00	1.00	2.00	4.20	29.60
11	14	2.80	4.20	2.20	2.60	2.60	1.60	3.00	1.60	1.80	1.80	2.00	1.40	1.60	29.20
12	25	1.20	1.00	2.60	2.60	2.80	1.80	4.20	1.80	2.60	2.20	1.20	2.00	3.00	29.00
13	32	1.80	1.00	3.80	3.00	2.40	1.60	3.80	2.20	1.80	1.80	1.00	1.40	3.40	29.00
14	52	1.60	1.00	4.80	3.40	2.20	1.80	3.20	1.20	2.40	1.60	1.40	1.80	2.40	28.80
15	45	1.00	1.00	2.80	3.00	1.80	3.20	3.20	1.40	2.40	1.60	1.60	1.60	2.80	27.40
16	27	1.20	1.20	2.20	2.40	2.40	1.80	3.60	2.00	3.60	1.80	1.20	2.20	1.60	27.20
17	26	1.40	1.00	2.20	2.40	2.20	1.80	3.80	2.40	3.40	1.80	1.20	2.00	1.40	27.00
18	36	3.60	4.20	1.40	1.60	1.60	2.20	3.40	1.80	1.40	1.20	2.00	1.60	1.00	27.00
19	35	3.20	4.20	1.40	1.60	1.60	2.20	3.60	1.80	1.40	1.20	2.00	1.60	1.00	26.80
20	31	2.00	1.00	3.60	2.20	1.80	1.40	3.60	2.00	1.40	1.60	1.20	1.80	3.00	26.60
21	34	3.20	4.20	1.40	1.60	1.60	2.20	3.60	1.80	1.40	1.20	1.80	1.60	1.00	26.60
22	7	1.20	2.60	1.60	2.20	1.60	2.20	2.80	1.40	4.20	1.80	1.20	2.00	1.40	26.20
23	37	1.60	1.00	3.80	2.80	2.00	2.20	3.20	1.80	1.60	1.20	1.20	1.20	2.60	26.20
24	49	1.20	1.00	3.00	2.40	2.60	1.60	3.20	1.60	3.20	1.40	1.60	2.00	1.20	26.00
25	38	2.20	1.00	3.40	2.60	1.60	2.00	3.00	1.40	2.20	1.40	1.20	1.40	2.00	25.40
26	30	2.20	1.00	3.40	2.00	2.00	1.60	3.20	2.00	1.20	1.40	1.20	1.40	2.00	24.60
27	39	1.80	1.00	3.00	2.20	2.00	1.40	3.00	1.60	2.00	1.40	1.20	1.60	2.40	24.60
28	16	1.40	1.20	1.80	1.80	1.60	1.20	3.80	3.60	2.60	1.20	1.00	1.60	1.00	23.80
29	44	1.20	1.00	2.80	2.80	1.60	2.40	3.00	1.40	1.40	1.40	1.40	1.60	1.80	23.80
30	13	1.40	1.80	1.80	2.00	2.00	1.60	2.20	1.40	1.60	1.80	3.20	1.40	1.20	23.40
31	15	1.40	1.00	1.40	1.60	1.60	1.20	4.20	2.00	2.20	1.40	1.60	2.60	1.20	23.40
32	43	1.00	1.20	3.00	2.00	1.80	2.00	3.40	1.80	1.40	1.40	1.40	1.20	1.40	23.00
33	8	1.20	2.00	1.20	1.40	2.20	1.60	2.00	1.20	2.60	2.20	2.20	1.60	1.00	22.40
34	51	1.00	1.00	3.20	2.20	2.00	1.80	2.40	1.20	1.80	1.60	1.40	1.40	1.40	22.40
35	17	1.60	1.40	1.40	2.00	2.00	1.80	3.00	1.60	2.80	1.00	1.20	1.40	1.00	22.20
36	18	1.00	1.00	1.80	1.60	1.80	1.20	3.00	2.40	2.20	1.40	1.00	2.00	1.40	21.80
37	47	1.40	1.00	3.20	2.00	1.80	1.20	2.60	1.40	1.20	1.80	1.40	1.20	1.40	21.60
38	48	1.00	1.00	3.20	2.00	1.80	1.20	2.60	1.40	1.20	1.80	1.20	1.40	1.40	21.20
39	22	1.20	1.40	2.80	1.40	1.40	1.00	3.00	3.20	1.00	1.00	1.00	1.60	1.00	21.00
40	28	1.00	1.00	1.80	2.00	2.00	1.00	1.60	3.20	1.00	1.60	2.40	1.20	1.20	21.00
41	40	1.60	1.00	3.00	1.80	1.40	1.60	3.00	1.80	1.00	1.00	1.00	1.20	1.40	20.80
42	21	1.00	1.00	2.60	1.60	1.20	1.00	3.00	2.20	1.00	1.00	1.00	3.00	1.00	20.60
43	23	1.00	1.00	2.20	1.40	1.60	1.00	3.40	3.20	1.00	1.00	1.00	1.60	1.20	20.60
44	29	1.20	1.40	1.80	1.80	1.40	1.00	1.80	3.40	1.00	1.20	2.60	1.00	1.00	20.60
45	12	1.00	1.20	1.00	1.20	1.40	1.00	3.80	1.20	1.80	1.40	2.60	1.80	1.00	20.40
46	20	1.40	1.20	2.80	1.20	1.20	1.00	3.00	2.00	1.00	1.40	1.00	2.00	1.20	20.40
47	19	1.40	1.00	2.80	1.40	1.40	1.00	3.20	1.60	1.00	1.20	1.20	2.00	1.00	20.20
48	50	1.00	1.00	2.60	1.80	1.80	1.60	2.00	1.20	1.60	1.40	1.20	1.20	1.20	19.60
49	42	1.00	1.00	2.60	1.40	1.80	1.40	3.00	1.60	1.40	1.00	1.00	1.20	1.00	19.40
50	11	1.60	2.40	1.20	1.80	1.40	1.00	1.40	1.20	1.00	1.00	2.80	1.40	1.00	19.20
51	9	1.00	1.40	1.20	1.60	1.40	1.00	2.20	1.20	1.20	1.40	2.80	1.40	1.00	18.80
52	10	1.00	1.40	1.00	1.60	1.40	1.00	2.00	1.20	1.20	1.40	2.80	1.80	1.00	18.80
53	41	1.00	1.20	3.40	1.40	1.60	1.20	2.20	1.40	1.00	1.20	1.00	1.00	1.00	18.60

Table 2: Assessment of the utilitarian and transformational value presented as the ranking of 50 motor skills/ knowledge items for female students of the 2nd secondary school form - the classification (P) according to the sum of all the scalar values (SSS)

(P = classification; S = a content item; SV = everyday life; UR = emergency situations; RE = recreational purposes; BM = ballast mass; MM = muscular mass; BR = speed; KO = co-ordination; RA = balance; EK = explosive power; RS = repetitive power; ST = static strength; FL = flexibility; AI = aerobic endurance; SSS = scalar values sum)

P	S	SV	UR	RE	BM	MM	BR	KO	RA	EK	RS	ST	FL	AI	SSS
01	5	2.80	4.80	4.20	3.80	3.40	3.60	4.40	2.80	3.60	2.60	2.00	2.20	4.00	44.20
02	50	4.40	4.20	5.00	4.00	4.00	1.20	1.80	1.80	2.40	3.20	2.00	3.80	2.20	40.00
03	1	4.20	4.80	5.00	4.40	2.80	2.20	1.80	1.40	2.00	2.60	1.40	1.40	5.00	39.00
04	3	2.80	4.80	3.40	3.80	2.80	4.20	2.00	1.40	4.20	2.00	1.20	1.20	3.60	37.40
05	2	2.80	5.00	2.80	3.40	2.80	4.60	2.00	1.40	4.60	2.00	1.40	1.20	3.20	37.20
06	4	1.80	3.20	2.60	3.40	2.40	4.60	3.40	1.60	4.20	2.20	1.40	1.20	3.00	35.00
07	30	3.00	1.20	4.20	3.00	2.20	2.00	3.80	1.60	3.00	2.00	1.40	2.00	3.20	32.60
08	6	1.80	4.60	1.60	2.60	2.20	3.00	3.80	1.40	5.00	1.80	1.40	1.60	1.60	32.40
09	40	2.20	1.20	3.80	3.20	2.40	2.60	3.60	1.20	2.60	2.00	1.20	1.60	3.80	31.40
10	21	1.80	1.20	3.80	3.20	2.60	2.00	3.60	1.60	3.20	2.00	1.40	1.80	3.00	31.20
11	31	4.40	4.60	1.60	1.20	1.80	2.00	3.40	2.00	1.80	1.60	1.20	1.80	2.20	29.60
12	33	2.00	1.40	3.60	3.20	2.00	2.80	3.40	1.60	2.20	1.80	1.20	1.20	3.00	29.40
13	29	2.20	1.20	3.40	2.40	2.00	1.80	3.80	1.60	2.20	2.20	1.40	1.60	3.00	28.80
14	32	4.00	4.60	1.60	1.20	1.60	2.00	3.40	2.00	1.80	1.60	1.40	1.40	1.40	28.00
15	7	1.40	3.00	1.80	2.40	2.00	2.60	3.00	1.40	4.40	1.60	1.40	1.60	1.20	27.80
16	49	1.80	1.00	4.20	2.40	1.80	2.20	3.20	1.20	2.60	1.80	1.40	1.60	2.40	27.60
17	34	2.40	1.20	3.60	2.60	1.60	2.00	3.20	1.20	2.20	1.80	1.20	1.40	2.40	26.80
18	23	1.20	1.00	2.40	2.20	2.20	1.60	3.40	2.00	3.80	1.80	1.20	2.00	1.80	26.60
19	46	1.20	1.00	3.00	2.00	2.00	2.00	3.40	1.60	3.40	1.80	1.80	1.60	1.80	26.60
20	22	1.20	1.00	2.40	2.40	2.00	1.80	3.60	1.80	3.60	1.60	1.20	2.20	1.60	26.40
21	28	2.20	1.20	3.60	1.60	1.80	1.60	3.40	1.60	1.80	2.00	1.20	1.80	2.60	26.40
22	20	1.60	1.20	2.60	2.00	1.80	1.60	3.20	2.40	2.60	1.60	1.20	2.40	2.00	26.20
23	16	1.60	1.00	3.20	1.60	1.60	1.60	4.00	2.60	1.20	1.60	1.40	2.60	1.60	25.60
24	37	1.80	1.60	3.20	2.40	1.80	2.20	3.20	1.60	1.80	1.60	1.00	1.40	1.80	25.40
25	48	1.20	1.00	3.20	1.80	1.60	2.40	3.20	1.20	2.60	1.80	1.60	1.60	1.80	25.00
26	26	1.00	1.00	1.40	1.80	1.60	1.40	3.40	4.40	2.40	1.20	1.20	2.20	1.60	24.60
27	12	1.60	1.60	2.00	1.60	1.60	1.20	3.60	3.60	1.80	1.20	1.80	1.80	1.00	24.40
28	39	1.60	1.20	2.80	2.00	1.40	2.40	3.00	1.20	2.20	1.80	1.20	1.60	2.00	24.40
29	14	1.40	1.20	1.80	1.80	1.80	1.40	3.40	2.20	3.00	1.20	1.00	2.40	1.40	24.00
30	11	1.60	1.20	1.80	1.40	1.20	1.20	3.60	2.20	3.00	1.40	1.60	2.20	1.40	23.80
31	19	1.40	1.80	2.60	1.20	1.20	1.20	3.40	3.20	2.40	1.20	1.00	1.80	1.40	23.80
32	8	1.20	2.20	1.20	1.80	2.40	1.80	1.40	1.20	3.20	2.20	2.40	1.40	1.00	23.40
33	18	1.40	1.60	2.80	1.20	1.20	1.40	3.60	3.20	1.80	1.00	1.00	1.80	1.40	23.40
34	27	1.60	1.20	2.00	2.20	1.80	1.80	3.00	1.60	1.60	1.40	1.20	1.40	2.60	23.40
35	47	1.20	1.00	2.80	1.60	1.60	2.00	2.60	1.20	2.80	1.40	1.60	1.60	2.00	23.40
36	35	2.20	1.20	3.00	1.60	1.80	1.40	3.00	1.20	1.60	1.40	1.20	1.40	1.40	22.40
37	25	1.00	1.00	1.60	1.80	1.60	1.00	2.60	3.80	2.00	1.20	1.20	2.00	1.40	22.20
38	38	1.60	1.00	2.40	2.20	1.40	2.60	2.80	1.20	1.80	1.20	1.00	1.40	1.60	22.20
39	13	1.40	1.20	1.20	2.00	1.80	1.60	3.20	1.60	2.80	1.00	1.40	1.80	1.00	22.00
40	17	1.00	1.00	2.20	1.40	1.40	1.40	4.00	2.80	1.20	1.00	1.00	1.80	1.60	21.80
41	42	2.00	1.00	3.20	1.60	1.80	1.20	2.40	1.40	1.80	1.40	1.40	1.40	1.00	21.60
42	36	1.80	1.20	3.00	1.20	1.40	1.80	2.60	1.40	1.80	1.60	1.00	1.20	1.40	21.40
43	24	1.00	1.00	1.60	1.80	1.80	1.00	2.40	3.40	1.00	1.60	1.20	2.20	1.20	21.20
44	15	1.00	1.00	2.40	1.80	1.40	1.00	3.20	1.80	1.20	1.20	1.00	2.40	1.20	20.60
45	41	1.60	1.00	3.40	1.40	1.60	1.00	2.40	1.20	1.60	1.60	1.40	1.20	1.20	20.60
46	44	1.60	1.00	2.60	1.40	1.60	1.40	2.40	1.60	1.60	1.60	1.40	1.40	1.00	20.60
47	45	1.60	1.20	3.00	1.40	1.60	1.20	2.60	1.20	2.00	1.60	1.20	1.00	1.00	20.60
48	10	1.00	1.60	1.40	1.60	1.40	1.00	3.00	1.60	1.00	1.80	2.00	1.80	1.00	20.20
49	43	1.20	1.00	3.00	1.40	1.60	1.20	2.40	1.20	1.60	1.80	1.20	1.40	1.20	20.20
50	9	1.20	1.20	1.20	1.40	1.40	1.00	2.00	1.20	1.00	1.60	2.60	1.80	1.00	18.60



*Table 3: Assessment of the utilitarian and transformational value presented as the ranking of 38 motor skills/ knowledge items for female students of the 3rd secondary school form - the classification (P) according to the sum of all the scalar values (SSS)*

(P = classification; S = a content item; SV = everyday life; UR = emergency situations; RE = recreational purposes; BM = ballast mass; MM = muscular mass; BR = speed; KO = co-ordination RA = balance; EK = explosive power; RS = repetitive power; ST = static strength; FL = flexibility; AI = aerobic endurance; SSS = scalar values sum)

P	S	SV	UR	RE	BM	MM	BR	KO	RA	EK	RS	ST	FL	AI	SSS
01	38	4.00	4.20	4.40	3.80	3.80	2.20	2.20	1.40	2.20	3.20	2.80	1.40	4.60	40.20
02	1	4.40	4.80	5.00	4.60	2.60	2.40	1.60	1.20	2.00	2.80	1.40	1.60	4.80	39.20
03	2	2.80	5.00	3.60	3.00	3.40	4.40	1.80	1.20	4.20	2.60	1.40	1.60	2.60	37.60
04	3	2.80	4.80	3.40	3.60	2.60	4.20	1.80	1.20	3.60	2.60	1.20	1.60	3.60	37.00
05	4	2.00	3.60	2.20	3.00	3.00	4.40	3.00	1.80	4.40	2.80	1.40	2.00	2.80	36.40
06	5	2.00	4.60	1.80	2.20	2.60	3.00	3.80	1.40	4.60	2.00	1.40	2.00	1.60	33.00
07	21	2.40	1.00	3.20	2.80	2.20	1.80	3.80	1.80	2.20	2.00	1.40	2.00	3.00	29.60
08	36	1.60	1.00	4.20	3.20	2.40	2.20	3.40	1.20	2.40	1.80	1.20	1.80	3.00	29.40
09	17	1.40	1.20	3.40	2.60	2.20	2.00	3.80	2.00	3.00	2.00	1.40	2.00	2.20	29.20
10	22	2.20	1.00	3.60	2.60	2.20	1.80	3.80	1.80	2.00	1.80	1.40	2.00	2.80	29.00
11	18	1.40	1.00	3.40	2.60	2.40	1.80	3.40	1.60	2.60	2.00	1.60	2.00	2.40	28.20
12	19	1.20	1.00	3.20	2.60	2.40	1.80	3.60	1.80	2.40	2.00	1.40	2.40	2.20	28.00
13	23	2.20	3.20	1.60	1.40	2.00	1.80	3.40	2.20	2.00	1.60	2.40	2.00	1.20	27.00
14	26	3.60	4.60	1.60	1.40	1.80	1.60	3.20	1.40	1.60	1.20	1.80	1.60	1.60	27.00
15	13	1.00	1.40	2.00	1.80	2.20	1.20	3.60	3.40	1.40	2.00	1.80	3.00	1.80	26.60
16	28	1.60	1.80	3.60	2.40	1.80	2.40	3.00	1.40	2.20	1.40	1.20	1.60	1.80	26.20
17	12	1.40	1.20	3.20	1.60	1.80	1.40	3.40	3.40	1.40	1.60	1.40	1.60	1.60	25.00
18	20	1.20	1.20	2.40	2.00	1.80	1.80	3.80	2.20	2.40	1.40	1.40	1.80	1.60	25.00
19	29	1.40	1.20	3.60	2.40	1.80	2.20	3.20	1.80	1.60	1.40	1.00	1.60	1.80	25.00
20	6	1.40	1.80	1.40	2.00	1.80	1.80	3.00	2.20	2.80	1.80	1.20	1.80	1.60	24.60
21	7	1.40	2.40	1.40	1.40	2.60	1.60	2.00	1.40	3.00	2.00	2.40	1.60	1.20	24.40
22	15	1.20	1.20	2.40	1.60	1.80	1.40	4.00	1.80	2.00	2.00	1.40	1.80	1.80	24.40
23	25	3.00	4.00	1.60	1.40	1.60	1.20	2.60	1.40	1.60	1.20	1.80	1.60	1.40	24.40
24	16	1.00	1.20	2.40	1.80	1.80	1.60	3.40	2.60	1.40	1.80	1.40	2.00	1.80	24.20
25	24	2.20	3.40	1.60	1.20	1.60	1.40	3.00	1.80	1.40	1.60	2.00	1.80	1.20	24.20
26	27	1.60	1.60	3.60	1.80	1.60	1.80	2.80	1.40	2.20	1.60	1.20	1.60	1.40	24.20
27	11	1.40	1.40	1.40	2.00	1.80	1.20	3.40	3.60	2.40	1.20	1.40	1.80	1.00	24.00
28	14	1.00	1.40	1.80	1.80	2.00	1.20	3.80	1.80	1.40	1.60	2.20	2.40	1.40	23.80
29	33	1.00	1.20	3.00	2.20	1.60	2.20	3.00	1.20	2.00	1.40	1.00	1.80	2.20	23.80
30	30	1.00	1.20	3.20	1.80	2.00	2.00	3.20	1.40	2.60	1.40	1.00	1.40	1.40	23.60
31	8	1.20	1.80	1.20	1.20	1.60	1.00	4.00	3.40	1.40	1.40	2.00	2.00	1.00	23.20
32	31	1.00	1.40	3.20	1.80	1.80	2.20	2.80	1.40	2.00	1.00	1.20	1.60	1.40	22.80
33	35	1.00	1.00	2.40	2.00	1.60	2.00	3.00	1.20	2.00	1.40	1.00	1.60	2.20	22.40
34	9	1.00	1.60	1.40	1.40	1.60	1.00	3.20	1.80	1.40	1.40	2.60	2.40	1.20	22.00
35	34	1.00	1.00	2.60	2.00	1.80	1.80	2.60	1.20	2.00	1.40	1.00	1.60	2.00	22.00
36	10	1.60	1.60	1.40	1.60	2.00	1.20	2.60	1.60	2.20	1.20	2.00	1.80	1.00	21.80
37	37	1.20	1.20	3.20	2.00	2.00	1.40	2.60	1.20	1.60	1.60	1.20	1.20	1.40	21.80
38	32	1.20	1.20	3.20	1.60	1.80	1.60	3.00	1.40	1.20	1.00	1.00	1.40	1.60	21.20

Table 4: Assessment of the utilitarian and transformational value presented as the ranking of 36 motor knowledge items for female students of the 4th secondary school form - the classification (P) according to the sum of all the scalar values (SSS)

(P = classification; S = a content item; SV = everyday life; UR = emergency situations; RE = recreational purposes; BM = ballast mass; MM = muscular mass; BR = speed; KO = co-ordination; RA = balance; EK = explosive power; RS = repetitive power; ST = static strength; FL = flexibility; AI = aerobic endurance; SSS = scalar values sum)

P	S	SV	UR	RE	BM	MM	BR	KO	RA	EK	RS	ST	FL	AI	SSS
01	1	4.20	4.80	4.80	4.40	2.80	2.60	2.00	1.40	2.00	2.60	1.40	1.60	4.80	39.40
02	2	2.60	5.00	3.80	3.00	3.00	5.00	2.20	1.40	4.40	2.60	1.40	1.60	2.60	38.60
03	4	1.60	3.60	2.60	3.20	3.00	4.80	3.40	1.80	4.20	2.40	1.60	2.00	3.00	37.20
04	3	2.60	4.40	3.40	3.40	2.80	4.00	2.20	1.40	3.60	2.40	1.20	1.60	3.40	36.40
05	5	1.80	4.40	2.00	2.20	2.80	3.20	4.20	1.60	5.00	1.80	1.60	2.40	1.60	34.60
06	36	3.60	3.60	4.60	3.00	2.40	2.60	2.60	1.60	2.40	2.00	1.40	2.20	2.20	34.20
07	26	2.80	1.00	4.20	3.20	2.40	2.20	4.00	2.00	2.60	2.40	1.60	2.20	3.20	33.80
08	25	2.60	1.00	3.80	3.20	2.20	2.00	4.00	2.00	2.40	2.40	1.60	2.00	3.20	32.40
09	15	1.20	1.00	1.80	2.20	2.40	1.80	4.20	4.00	2.40	2.00	1.60	3.00	2.00	29.60
10	35	1.60	1.00	4.20	2.80	2.00	2.60	3.40	1.40	2.60	1.40	1.40	2.00	2.80	29.20
11	34	1.40	1.00	4.40	2.20	2.00	2.20	3.40	1.20	2.40	1.80	1.40	2.20	2.40	28.00
12	8	1.00	1.20	1.40	1.60	2.40	2.20	4.20	2.60	3.40	1.60	1.80	2.20	2.00	27.60
13	12	2.00	2.00	2.20	2.20	1.80	2.00	3.40	2.60	3.00	1.80	1.00	1.60	2.00	27.60
14	28	2.80	3.60	1.80	1.80	1.60	2.20	3.20	1.40	2.40	1.40	2.00	2.00	1.40	27.60
15	14	1.00	1.00	1.80	2.00	2.20	1.80	4.20	3.20	2.20	1.60	1.60	2.80	2.00	27.40
16	27	2.60	3.40	1.80	1.80	1.80	2.20	3.20	1.40	2.40	1.40	2.00	1.80	1.40	27.20
17	13	1.00	1.20	1.60	1.80	1.80	1.40	3.60	4.20	2.00	1.40	2.00	2.40	1.80	26.20
18	6	1.20	1.20	1.20	2.00	2.20	1.60	3.20	2.00	3.20	1.60	1.60	2.00	2.00	25.00
19	11	1.20	1.20	1.80	1.60	2.00	1.60	3.60	3.40	2.00	1.80	1.20	1.80	1.80	25.00
20	7	1.20	1.60	1.20	1.40	2.40	1.20	2.80	2.20	3.00	2.40	2.40	1.60	1.00	24.40
21	24	1.20	1.00	2.00	1.40	1.00	1.60	3.80	2.60	2.20	1.60	1.20	2.60	2.20	24.40
22	16	1.00	1.00	2.00	2.20	1.80	1.80	3.60	2.00	2.00	1.40	1.20	2.40	1.40	23.80
23	9	1.20	1.60	1.20	1.80	1.80	1.20	3.40	1.60	2.20	1.60	2.40	2.00	1.20	23.20
24	23	1.00	1.00	1.80	1.60	1.80	1.80	4.00	2.40	1.40	1.40	1.20	2.40	1.40	23.20
25	32	1.20	1.20	3.00	1.80	1.40	1.80	2.80	1.20	2.00	1.40	1.40	2.40	1.60	23.20
26	31	1.20	1.40	2.80	1.40	1.60	2.00	3.20	1.20	1.80	1.20	1.40	2.20	1.20	22.60
27	10	1.00	1.40	1.80	1.40	2.00	1.20	2.80	1.20	1.80	1.60	3.20	1.60	1.20	22.20
28	29	1.40	1.00	3.60	1.40	1.60	1.60	2.80	1.20	1.60	1.40	1.60	1.60	1.20	22.00
29	33	1.00	1.00	2.80	1.80	1.60	2.00	2.40	1.20	2.20	1.40	1.20	1.60	1.80	22.00
30	19	1.00	1.20	2.00	1.40	1.40	1.60	3.40	2.40	1.80	1.40	1.00	2.00	1.20	21.80
31	18	1.00	1.00	2.20	1.20	1.40	1.80	3.40	1.80	1.80	1.40	1.40	1.80	1.20	21.40
32	30	1.40	1.00	3.40	1.40	1.60	1.60	2.40	1.40	1.60	1.20	1.60	1.80	1.00	21.40
33	17	1.00	1.00	2.20	1.40	1.20	1.60	3.80	1.80	1.60	1.20	1.00	2.00	1.40	21.20
34	20	1.00	1.20	2.00	1.40	1.60	1.80	3.60	1.80	1.20	1.40	1.00	1.80	1.20	21.00
35	22	1.20	1.20	2.20	1.60	1.40	1.60	2.60	1.40	1.20	1.40	1.20	2.20	1.20	20.40
36	21	1.00	1.00	1.60	1.20	1.00	1.40	3.20	1.60	1.20	1.20	1.00	1.60	1.00	18.00

## Discussion

The research results are presented in Tables 1-4, in a rank order according to the total value per year (SSS) – a sum of the mean values given by the judges concerns the general influence of a content item on all the

characteristics, abilities and utilities/ benefits - and particularly for each characteristic, ability and benefit. The first column (P) presents the rank order of each assessed content item based upon the item's contribution to the general result, i.e. to the transformation of all the characteristics and abilities and to the

practical purposes for life and health benefits (utility). The second column displays the ordinal numbers from the list of the content items. The other columns represent a particular item contribution to each characteristic, ability or utility.

The obtained results should be analysed from two standpoints. The first one concerns the contribution of the PE content items to changes in all the characteristics and abilities, as well as to the beneficial and practical effects achievement. The greater the numeral in the last column, the greater the transformational and utilitarian value of the item in question. If the goal of the exercising process is to achieve simultaneously as many aims as possible, then the more important content item becomes the one with the greater number in the last column. In simple terms, the most valuable are the content items of a higher complexity, the ones that stimulate the realization of several goals simultaneously. For example, the content items number 53 and 1 (from the Table 1 for the 1<sup>st</sup> form) have such characteristics. This result was expected because these items concern the submaximal dynamic and explosive stimuli, on one hand, and various cyclic movement patterns, on the other, which, besides causing increments in the muscle mass, can significantly influence the reduction of the ballast mass and enhancement of both the repetitive and explosive power, as well as the aerobic endurance. The cited content items or motor skills/ knowledge are very important in the realization of all three benefits.

However, the selection of the PE content items should not be focused on their general applicability only, but their influence on the particular single characteristic, ability and even the benefit or practical purpose should be taken into account as well. If the partial goal of the PE or exercise process is to influence only one characteristic or ability for the time being, then it is necessary to find the content items with the greatest numerical value in the respective columns, i. e. the item with the greatest projection on the attribute in question. For example, if the aim is to enhance the explosive power in secondary school female students, the content items number 6, 7 and 2 should be added to the programme. These contents include short sprinting, various kinds of jumping and throwing, which are undoubtedly the essential manifestations of explosive power.

The selection of content items which are going to be selected for the exercise programmes depends on the aims previously set in the space of characteristics, abilities and acquisition of practical skills or benefits (space of utility). The aims of the exercising process are determined in accordance with the recognized actual state of a student and working conditions (premises, facilities, equipment) under which a certain content item is going to be administered. The students' interests and exercise activities preferences should not be ignored either. In a practical sense it would be necessary to select the contents more carefully when there are some limitations concerning the working conditions. Therefore, instead of, ideally, using the best content item, according to the research results which may be the most optimal one, but for the implementation of which there are no material provisions or conditions, it would be feasible to choose another, the second best or valuable one that could be implemented under the given circumstances. The same applies when the students' preferences are concerned.

## Conclusion

In conclusion it should be stated that the research results provide a higher level of objectivity and the scientific approach to the PE contents-selection according to the individual characteristics of students, their actual status and interests. The findings can significantly intensify PE teaching and influence the planning of the exercise processes so as to form the core from which the extended curriculum develops, inducing active lifestyles in different intra- and extramural environments, such as other education subjects, or extra curricular activities, family life, wider community life, and leisure time activities. Such a programme of PE is indispensable if the aims regarding the characteristic and ability transformations are to be achieved in order to enhance the health-benefits, everyday competence and performance, as well as the enlargement of the body of motor knowledge or life skills. PE teaching in the secondary school should by no means be focused only on the motor skills/ knowledge acquisition and mastery, but should contribute to the students' characteristic and ability transformation (fitness and conditioning) as well.

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